

Case 18

Support for the Development of the Pap Smear Test

The Commonwealth Fund, 1941

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Background. In 1913, a physician named George Papanicolaou moved from Greece to the United States and began to study chromosomes and sex determination at Cornell Medical College, in New York.²⁹⁹ Dr. Papanicolaou proved that the vaginal smear technique was effective in observing the human sex cycle, and by 1928, he was convinced that observing vaginal smear samples under a microscope enabled him to differentiate between normal and cancerous cells, a claim that was vigorously contested by the medical establishment. Pathologists were not convinced that it was possible to detect cancer by observing individual cells, and, in any case, they argued that the existing technique for diagnosing uterine cancers—biopsy—was effective and accurate enough. Discouraged, Dr. Papanicolaou abandoned his cancer research, focusing instead on such fields as ovulation. At the time, cervical cancer was the deadliest of all forms of cancer among women.

Strategy. Ten years later—in 1939—however, Dr. Papanicolaou returned to the study of cellular irregularities, using exfoliative cytology,³⁰⁰ when he began to collaborate with a gynecologist named Herbert Traut. At first, the pair had great difficulty obtaining funding. Papanicolaou's techniques had still not won acceptance, and traditional funders of cancer research declined to offer them support. In 1941, however, the Commonwealth Fund took a chance on Papanicolaou, offering him an \$1,800 research grant that was considered “highly speculative.”³⁰¹

Outcomes. Using smears obtained from Dr. Traut's patients, Papanicolaou was able to establish definitively that exfoliative cytology revealed cellular irregularities—even before they had become cancerous—far earlier than biopsy could. In 1943, the Commonwealth Fund published Papanicolaou's now-classic monograph, *Diagnosis of Uterine Cancer by the Vaginal Smear*, which demonstrated his findings conclusively.

Its effect was tremendous. As soon thereafter as 1960, the American Cancer Society estimated that over 6 million American women had received Pap Tests (named for Dr. Papanicolaou), and that deaths from uterine cancer had been reduced—by Dr. Papanicolaou's work—to half of what they would otherwise have been.³⁰² Today, the Pap Smear Test is a routine part of every gynecological checkup. It is still “the most effective screening test for cervical cancer.”³⁰³ Exfoliative cytology was also subsequently applied by Dr. Papanicolaou to detect respiratory, gastrointestinal, urinary, and other types of tumors.³⁰⁴

Impact. According to Quest Diagnostics' online Patient Health Library, Pap Tests, when performed regularly, “almost always detect cervical cell changes before the changes become cancerous.”³⁰⁵ This is critical, since cervical cancer, like virtually all cancers, is far less deadly when it is detected early. As a result, “the use of the Pap Test as a screening tool for cervical cancer has dramatically increased cure rates.”³⁰⁶ It is no exaggeration to say that Dr. Papanicolaou's work has saved millions of women's lives over the past half century.

Dr. Papanicolaou, himself, believed that the support of the Commonwealth Fund—which provided him with over \$120,000 between 1941 and 1951³⁰⁷—was of critical importance in allowing him to develop the Pap Test and prove its efficacy. As he wrote in 1953 to Roderick Heffron, the Commonwealth program officer who had, at the time, been in charge of medical research:³⁰⁸

At this moment as I am writing what is possibly my last report to you, my thoughts return to the time some eleven and one-half years ago when our first application for financial support was submitted to the Commonwealth Fund.

That was one of the most critical periods in my scientific career as it was then that I found myself totally deprived of funds for the continuation of my research.... Both projects [I had tried to undertake] were rejected by every one of the societies supporting cancer research to which I turned for help.

It was then, at a moment when every hope had almost vanished, that the Commonwealth Fund, a society not primarily devoted to cancer research stepped in. . .

As I write these lines my eyes are moist from the memory of those critical days. It is with a feeling of deep gratitude that I want to express my appreciation to the Commonwealth Fund for having extended to me since that time the financial and moral support which made possible the continuation of my scientific studies....What appeared to be a speculative project eleven years ago is now a recognized and well founded contribution to the biological and medical sciences. *This could never have been realized without the inspiration and help which came from the Commonwealth Fund.* . . [emphasis added]

Notes

259. While Dr. Papanicolaou's most significant medical achievement was the development of the Pap Smear Test, his earlier work on measuring female sex cycles contributed to the first isolation—by Willard Allen—of a hormone: estrogen.
260. Exfoliative cytology is the practice of using cells shed from some part of the body, or from a tumor, to identify cancer or hormonal irregularities. http://www.medicinenet.com/pap_smear/page7.htm.
261. Mary Lou Russell, Robert Oksner, and Anne Mackinnon, *For the Common Good: The Commonwealth Fund 1918–1993* (New York: The Commonwealth Fund, 1994).
262. Erskine Carmichael, *The Pap Smear: Life of George N. Papanicolaou* (Springfield: Charles C. Thomas, 1973).
263. Available from <http://www.questdiagnostics.com>.
264. Available from http://www.medicinenet.com/pap_smear/page7.htm.
265. Ibid.
266. Ibid.
267. Carmichael, *The Pap Smear: Life of George N. Papanicolaou*.
268. Harvey McGehee, *For the Welfare of Mankind: The Commonwealth Fund and American Medicine* (Baltimore: Johns Hopkins University Press, 1986).